

This document contains the Connecticut regulations for Dam Safety. This document was prepared by the State of Connecticut Department of Environmental Protection and is provided for the convenience of the reader. This is not the official version of the regulations. The official regulations are published by the State of Connecticut, Judicial Branch, Commission on Official Legal Publications in the Connecticut Law Journal. In the event there is inconsistency between this document and the regulations as published in the Connecticut Law Journal, the Connecticut Law Journal publication will serve as the official version.

## **DAM SAFETY REGULATIONS**

Section 1. Subsection (a) of Section 22a-409-1 of the Regulations of Connecticut State Agencies is amended to read as follows:

### **Section 22a-409-1. Registration of dams and similar structures.**

(a) Definitions. AS USED IN SECTION 22A-409-1 and 22A-409-2:

- (1) "Abutment" means natural ground that borders on either end of the dam structure.
- (2) "Acre-Foot" means a unit of volume equal to 43,560 cubic feet or 325,853 gallons (one foot depth over one acre).
- (3) "Average Daily Traffic" (ADT) means a measure of the number of vehicles using a specific road in an average twenty-four hour period.
- (4) "Appurtenance" means any structure or mechanism other than the dam itself which is associated with its operation.
- (5) "Breach" means an alteration of a dam either deliberately or accidentally in such a way as to release its impounded waters.
- (6) "Commissioner" means the Commissioner of Environmental Protection.
- (7) "Dam" means any barrier of any kind whatsoever which is capable of impounding or controlling the flow of water, including but not limited to storm water retention or detention dams, flood control structures, dikes, and incompletely breached dams.
- (8) "Dam Height" means the vertical distance from the crest of the dam or similar structure to the downstream toe of such dam or similar structure.
- (9) "Embankment" means the fill material, usually earth or rock, placed with sloping slides providing a barrier which impounds water.
- (10) "Flood" means a general and temporary condition of partial or complete inundation of normally dry land areas.
- (11) "Hazard Potential" means probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage.
- (12) "Owner" means any individual, firm, partnership, association, syndicate, company, trust, corporation, municipality, agency or political or administrative subdivision of the state, or any other legal entity of any kind holding legal title to the dam.
- (13) "Structure" means the dam, its appurtenances, abutments and foundation.

- (14) "Toe" means the base portion of the impounding structure which intersects with natural ground at the upstream and downstream sides.

Section 2. The Regulations of Connecticut State Agencies are amended by adding Section 22a-409-2. Dam Safety Inspection Regulations.

**Section 22a-409-2. Dam Safety Inspection Regulations.**

- (a) Jurisdiction. All dams which must be registered pursuant to Section 22a-409 of the Connecticut General Statutes shall be under the jurisdiction of the Commissioner. Dams of the State, or any political subdivision thereof, and all dams within the State except those of the United States or its instrumentalities are included within the jurisdiction conferred by this section.
- (b) Periodic inspections. The following dams shall be regularly inspected by the Department of Environmental Protection at a frequency as described in Section 22a-409-2(e)(2) of these regulations:
- (1) Dams which pose a significant (B) or high (C) hazard to life or property as defined in Section 22a-409(d);
  - (2) Dams which are:
    - (A) greater than twenty-five (25) feet in height with an impoundment capacity greater than fifteen (15) acre-feet; or
    - (B) greater than six (6) feet in height but less than or equal to twenty-five (25) feet in height with an impoundment capacity greater than fifty (50) acre-feet; or
  - (3) All other dams with an impoundment capacity of three (3) acre-feet or more.
- (c) Periodic Inspection Procedures.
- (1) Each periodic inspection shall consist of, but not be limited to, the following:
    - (A) Visual inspection of the dam, its appurtenances, abutments, downstream toe and all other areas which could affect the safety of the dam. In addition, inspection and operation of mechanical systems, and inspection of the abutments downstream, the components of the dam which are under water during normal operation, or the interior of outlet conduits shall be made by the owner, if required by the Commissioner to more completely assess the condition of the dam;
    - (B) Review and analysis of available data on the design, construction, operation, maintenance and performance of the structure;
    - (C) Observation of the nature and extent of downstream development which would be subject to inundation in the event of a dam breach for purposes of assessing the potential hazard which the dam poses;

- (D) Evaluation of the general condition of the structure, including when possible, assessment of its hydrologic and its hydraulic capabilities and structural stability.
  - (E) Evaluation of the operation, maintenance and inspection procedures employed by the owner.
  - (F) Evaluation of any other conditions which constitute or could constitute a hazard to the integrity of the structure.
- (2) The inspection shall be performed by qualified personnel of the D.E.P. Dam Safety Program with technical training in the inspection of dams and under the supervision of a civil engineer.
- (3) A standard dam inspection checklist based upon accepted standards of visual dam inspection and guidelines which direct the proper use of the checklist shall be prepared by the Commissioner and will be utilized by the inspection team. The Commissioner will issue a written report based on the findings of the periodic inspection which shall include, but not be limited to, the following:
- (A) An assessment of the condition of the structure based on the visual observations, available data on the design, construction, operation, maintenance and performance of the structure, the hydrologic and hydraulic capacities and the structural stability of the structure;
  - (B) Recommendations for any emergency measures or actions, if required to assure the immediate safety of the structure;
  - (C) Recommendations for remedial measures and actions related to design, construction, operation, maintenance and inspection of the structure, if required; and
  - (D) Recommendations for additional detailed studies, investigations and analyses, if required; and
  - (E) Recommendations for routine maintenance and inspection by the owner, if required.
- (4) The Commissioner shall furnish a copy of the written report to the owner.
- (A) The owner shall within thirty (30) days of receipt of the written report, inform the Commissioner in writing of his or her schedule of implementation of any required recommendations.
  - (B) A copy of the report will be kept on file with the records of the Commissioner pertaining to dam safety.

(d) Classification of Dams:

- (1) The Commissioner shall assign each dam to one of five classes according to its hazard potential. Such classification shall be determined by the Commissioner during the initial periodic inspection.
  - (A) A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:
    - (i) no measurable damage to roadways;
    - (ii) no measurable damage to land and structures;
    - (iii) negligible economic loss.
  - (B) A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:
    - (i) damage to agricultural land;
    - (ii) damage to unimproved roadways (less than 100 ADT);
    - (iii) minimal economic loss.
  - (C) A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:
    - (i) damage to normally unoccupied storage structures;
    - (ii) damage to low volume roadways (less than 500 ADT);
    - (iii) moderate economic loss.
  - (D) A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:
    - (i) possible loss of life;
    - (ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc.;
    - (iii) damage to or interruption of the use of service of utilities;
    - (iv) damage to primary roadways (less than 1500 ADT) and railroads;
    - (v) significant economic loss.
  - (E) A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:

- (i) probable loss of life;
  - (ii) major damage to habitable structures, residences, hospitals, convalescent homes, schools, etc.;
  - (iii) damage to main highways (greater than 1500 ADT);
  - (iv) great economic loss.
- (2) The classification of a Class A, BB, B, and C dam shall be reviewed during each periodic inspection.
- (3) All dams will be subject to reclassification at any time the Commissioner determines that the hazard potential has changed.
- (4) Potential future development of the area downstream from the dam that would be affected by its failure shall be considered in determining the classification.
- (5) Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of this dam shall be at least as great as that of the downstream dam.
- (6) Potential damage to habitable structures will be considered minor when habitable structures are not within the direct path of the probable flood wave produced upon failure of a dam and when such structures will experience:
  - (A) No more than 1.5 feet of rise of flood water above the lowest ground elevation adjacent to the outside foundation walls; or
  - (B) No more than 1.5 feet of rise of flood water above the lowest habitable floor elevation of the structure; the lower of the elevations governing.
- (7) The extent of potential damage resulting from a dam breach may, notwithstanding the above, justify designating damage as either major or minor. Such a designation may be made after a detailed analysis has established the relative impact of the probable dam breach and has considered the following factors:
  - (A) The conditions prior to and after a dam breach;
  - (B) The extent to which, access has been affected, both before and after a dam breach;
  - (C) The extent of damage.
- (e) Inspection Schedule.
  - (1) The Commissioner or his representative may enter upon private property at any time to investigate or inspect any dam.

- (2) The Commissioner shall periodically inspect all dams in accordance with the following schedule. These time periods are the minimum time between inspections, more frequent inspections may be performed at the discretion of the Commissioner.

HAZARD CLASS	INSPECTION FREQUENCY
Class A (low)	10 years
Class BB (moderate)	7 years
Class B (significant)	5 years
Class C (high)	2 years

- (3) Inspections scheduled according to the time period set forth above, may be modified, at the discretion of the Commissioner, in special cases where it is desirable to observe a dam under particular conditions (i.e. wet season, dry season, foliage...).
- (4) The Commissioner may require scheduled inspections on a more frequent basis if particular conditions exist which require more frequent monitoring.
- (5) The Commissioner may require Class B and C dams to be inspected after the occurrence of a major flood event. The date of these post-flood inspections will be the starting date from which the date of the next regularly scheduled periodic inspection will be computed.
- (6) The Commissioner shall exempt from periodic inspections, any dam which, after an initial inspection, impounds less than three (3) acre-feet of water, or any Class AA dam, unless the Commissioner determines that such dam poses a unique hazard.

(f) Inspection by the Owner.

- (1) A dam owner may elect to employ the services of a professional engineer registered in the State of Connecticut, experienced in the design, construction and inspection of dams to inspect the owner's dam according to the following schedule:

HAZARD CLASS	INSPECTION FREQUENCY
Class A (low)	10 years
Class BB (moderate)	7 years
Class B (significant)	5 years
Class C (high)	2 years

- (2) The owner shall furnish a copy of each completed inspection report in a format determined by the Commissioner within thirty (30) days of the date of the inspection to the DEP Dam Safety Program.

- (3) The inspection report shall be sealed by a professional engineer registered in the State of Connecticut and shall include:
  - (A) Those items listed in Section 22a-409-2(c), and
  - (B) Correspondence from the owner stating his or her intent to implement such recommendations, if required.
- (4) If the dam owner elects to comply with subdivisions (1) through (3), inclusive, the Commissioner shall periodically inspect the dam according to the following schedule:

HAZARD CLASS	INSPECTION FREQUENCY
Class A (low)	20 years
Class BB (moderate)	14 years
Class B (significant)	10 years
Class C (high)	6 years

The year the Commissioner inspects the dam, the owner shall be exempt from conducting his or her own inspection.

(g) New Dam Construction.

- (1) All dams, and dams which have a high or significant hazard classification undergoing substantial repairs according to the permit authorization of the Commissioner, must be inspected by the professional engineer employed by the dam owner for construction services according to the following schedule:
  - (A) Upon first filling of the impoundment, after completion of new construction or substantial repairs, inspection should be performed to assure proper functioning of dam components.
  - (B) Upon attainment of full impoundment, inspections of the dam should be performed frequently for the first two (2) months.
  - (C) These dams shall be inspected at least annually for the first three (3) years of operation.
  - (D) After the third year of operation, these dams will be inspected according to the inspection schedule set forth in Section 22a-409-2-(e).
  - (E) The Commissioner may exempt from the requirements of this subsection repairs to high and significant hazard dams which he determines do not affect the immediate safety of the dam.
- (2) The inspection report must be submitted by the owner's engineer to the Commissioner on a form prescribed by him, within thirty (30) days after:



(A) The last inspection performed during the first two (2) months after full impoundment was attained; and

(B) Each annual inspection as set forth in Section 22a-409-2(g)10(C).

(h) Fees for Inspection by the State.

- (1) Each owner shall pay an inspection fee to cover the cost to the State of making both scheduled inspections and post-flood inspections. Such fee bill shall accompany the written report and shall be paid within thirty (30) days after receipt by the owner.
- (2) The owner shall submit the inspection fee by check or money order payable to DEP Dam Safety Program.
- (3) Pursuant to Sec. 22a-409 of the CT General Statutes, as amended by P.A. 6806, fees for Class A, BB, B and C dams are \$525.00.
- (4) The Commissioner shall waive the inspection fee for any dam which is owned by the State of Connecticut.

(i) Notification.

- (1) The Commissioner shall notify a dam owner of the upcoming date for a regularly scheduled inspection at least ninety (90) days before the inspection.
- (2) If, the Commissioner does not receive notification of the owner's intent to perform the inspection with his or her own engineer thirty (30) days prior to the date of the scheduled inspection, the Commissioner shall inspect the dam and charge the owner the appropriate fee.
- (3) If after notification by the owner of his or her intent to perform the inspection, the Commissioner does not receive a copy of the inspection report within thirty (30) days of the scheduled inspection date, the Commissioner shall inspect the dam and charge the owner the appropriate fee.

(j) Responsibility of the Owner.

- (1) Inspections by the State do not relieve an owner of the dam of the legal duties, obligations or liabilities incidental to the ownership or operation of the dam.
- (2) The owner or his or her representative shall inspect the dam on a frequent basis to assure that no unsafe conditions are developing including but not limited to, weather related damage, animal activity or vandalism. Class B and Class C dams shall be inspected by the owner or his or her representative at least quarterly and a written record shall be maintained and be made available to the Commissioner upon request.
- (3) The owner or his representative shall inspect the dam during and after the occurrence of major flood events to assure that the structure is withstanding the flood waters safely.

- (4) The owner shall fully and promptly advise the Commissioner of any sudden or unpredicted floods, unusual circumstances or major changes in the condition of the dam.
- (5) The owner shall report to the Commissioner any major damage which the dam suffered, such as, overtopping by flood waters, erosion of the spillway discharge channel and any major problems which are observed to have developed such as, new seepage or a significant increase in seepage quantities, settling, cracking or movement of the embankment or any component of the dam.
- (6) To facilitate visual inspection during the intervals between regularly scheduled inspections, the dam owner shall be required to maintain the structure and adjacent area free of brush and tree growth.
  - (A) Brush and tree growth shall be cleared from embankments and within twenty-five (25) feet of the downstream toe and the abutment embankment contact;
  - (B) Grass or other suitable vegetative cover must be established and maintained on abutments and embankments.
- (7) The owner shall maintain a written record of all inspections and maintenance work performed. This record shall include observations made regarding areas of concern on the structure and descriptions of the major and minor repairs performed and materials utilized.

Statement of Purpose: To establish a schedule for the frequency of inspection of dams and similar structures and the inspection fees for regularly scheduled inspection sufficient to cover the reasonable cost to the State of making these inspections. For further information, contact the Bureau of Water Management's Inland Water Resources Division, Dam Safety Section at (860) 424-3706.

Effective: 4/30/87